Pan-European energy: Jolting Spain out of the financial crisis

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Jolting Spain out of the Financial Crisis

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ABSTRACT

Spain's current economic situation as it passes through the global financial crisis has produced a series of significantly detrimental economic circumstances. This has left Spain with a record high unemployment rate, banks floundering in the stagnant real-estate market, and the need for a possible bailout in its future. These economic afflictions have created a necessity for Spain to development new economic fortes and form a farsighted economic plan of action. Meanwhile the European Union (EU) has made the goal to reduce CO_2 emissions 80% by 2050. The European Climate Foundation has been tasked by the EU to formulate a Roadmap that eliminates Europe's dependence on carbon energy through the mixture of a pan-European switch to less carbon intensive technologies and the development of a European energy grid based on the flow of renewable power from country to country derived from supply and demand.

This paper examines the complementary opportunities and weaknesses present in Spain's economic situation and in the goals specified in the Roadmap. It is shown that Spain can utilize its comparative advantages towards become a leading supplier of renewable energy, which can lead to resolution of some of the problems caused by the economic crisis while provide a competitive advantage for Spain in years to come.

INTRODUCTION

Don Quixote: Dost thou not see? A monstrous giant of infamous repute whom I intend to encounter.
Sancho Panza: It's a windmill.
Don Quixote: A giant. Canst thou not see the four great arms whirling at his back?
Sancho Panza: A giant?
Don Quixote: Exactly

Miguel de Cervantes (1605) – Don Quixote de la Mancha

This quote from the famous Spanish novel Don Quixote de la Mancha brings to mind the vast history Spain has with the use of wind power in its industry. Of course, the industrial use of wind power has changed immensely since Quixote's squire Sancho Panza tried desperately to keep his knight from attacking a pesky windmill. Spain is the fourth largest producer of wind power in the world after the USA, China and Germany, an impressive feat when considering that Spain had relatively no industry prior to 1996 (Gutiérrez, 2010).

As Spain's economy has followed the rest of the world into the financial crisis over the last three years, a startling reality has become apparent. The core sectors of the economy, responsible for Spain's fruitful economic development over the last thirty years, have become obsolete and are not recuperating successfully from the consequences of the crisis. Spain's principal economic focus over the years has traditionally centred on the automobile, tourism, construction, and public sectors - arguably those most affected by the economic crisis.

The European Union (EU) has designated the objective of having a minimum 80% reduction in usage of carbon energy by the year 2050 throughout the entire continent, replacing future demand with renewable resources. This undertaking will require an immense pan-European cooperation effort to reach development landmarks. Spain is one of the leading countries in renewable energy. The European Climate Foundation (ECF) has been tasked by the EU to formulate a Roadmap that eliminates Europe's dependence on carbon energy through the mixture of a pan-European switch to less carbon intensive technologies and the development of a European energy grid based on the flow of renewable power from country to country derived from supply and demand. Spain may therefore view the ECF Roadmap as an opportunity to continue expanding its capacities to augment and reinvent its struggling economy.

Political policies, pan-European cooperation, and a focus on energy efficiency and renewable energy, in conjunction with the targets of the ECF Roadmap 2050 will enable Spain to address its economic weaknesses revealed by the economic crisis through innovative opportunities as a supplier of renewable energy for all of Europe.

1. THE ECONOMIC CRISIS IN SPAIN

To examine solutions that the renewable energy market offers to the problems of the economic crisis in Spain, it is paramount to foremost investigate the negative effects the crisis is having on the Spanish economy. To analyse this, the history leading to the crisis, the obstacles to the housing and labour markets and the need for financial reform must be examined.

1.1 PREFACE TO THE ECONOMIC CRISIS

Over the last thirty-five years since the end of Francisco Franco's dictatorship, Spain has rampantly invested in its economy reaching the ninth highest GDP in the world in 2009 (International Monetary Fund, 2009). With economically sound countries such as Germany, France, and the United Kingdom facilitating efficient progress, Spain quickly underwent bountiful economic growth, making it a significant power in the European Union. The funds for the intense investment in Spain came from the country's wise management of savings and the accumulation of substantial trade deficits, making up 11% of GDP by 2009 (Shuman and Mateo-Yanguas, 2010).

The investments made throughout these years led to the now highly trained and technologically competent Spanish workforce; however, the trend of indebtedness has led to a requirement for the government and national banks to provide subsidies conservatively and procure finance externally to afford the high interest rates on debt formed by the recession (Shuman & Mateo-Yanguas, 2010).

Leading up to the international economic crisis Spain's forefront economic industries were the public sector, tourism, and construction (Royo & Manuel, 2003). While the Spanish public sector went through significant salary cuts and layoffs after the crisis began, it has altogether continued to be relatively stable. Spain is the second most popular holiday destination, which is generally a huge driver of the Spanish economy. However, since nearly all developed countries are currently experiencing the financial crisis, tourism has decreased significantly in Spain and these adverse effects are reflected as such in its GDP (Shuman & Mateo-Yanguas, 2010). As the world's economy recuperates tourism will indisputably increase once again; however, other economic weaknesses in Spain require that alternative economic growth opportunities be established.

1.2 CONSTRUCTION INDUSTRY

Spain's housing bubble grew seemingly endlessly up to the year 2008. Prime real estate along the expansive Spanish coasts attracted the attention of developers and investors, foreign and local alike. Rising housing prices did not deter the accumulation of billions of Euros of debt throughout the real-estate industry, and lax political and private regulation of the investment market led to the trend of speculation on risky mortgage-backed securities (Gutiérrez, 2010). When the housing bubble finally burst in late 2007 with several owners left with negative equity, the construction and housing industries halted almost instantaneously. This created a shockwave of investment default considered to be even more damaging than the bubble in the United States. High housing prices left as many as 800,000 properties unsold, a figure that Spanish banks are still trying to recuperate from (Shuman & Mateo-Yanguas, 2010). Companies defaulting and poor hiring policies have led to the abnormally high unemployment rate in the construction industry in Spain over the last two years.

1.3 UNEMPLOYMENT RATE IN SPAIN

The global economic crisis has affected the employment rate in Spain profoundly. In 2007 before being augmented by the financial crisis the unemployment rate was still quite high at 13%; however, recent reports have stated the rate to be at an astronomically high 19.1% (Kirby et al, 2010). The unemployed segment is made up alarmingly of recent university graduates, who are unable to find suitable employment opportunities. This is due in part to the trend of temporary contract position, and not promoting employee or employer investment in training, creating a toxic employment market with a multitude of chronically inexperienced and disloyal new entrants. As a result, an exodus of highly trained Spanish talent to other countries where lasting careers are more abundant has begun (Gutiérrez, 2010).

The decline in employment opportunities in Spain has been attributed to a market saturation of highly trained talent, financing difficulties requiring companies to act frugally and limit costs, and incompetent corporate regulations causing poor hiring criteria (Shuman & Mateo-Yanguas, 2010). Future political and corporate policies should include the implementation of programs that encourage stable employment in growing sectors that provide jobs for an educated workforce.

1.4 FINANCIAL MARKETS IN SPAIN

Spain was in a relatively healthier position financially than Greece, Portugal and Ireland prior to the beginning of the financial crisis. Amid the financial crisis, Spain is being fiscally compared to these countries and considered for a potential European Central Bank bailout. The single currency unit in the European Union has created a disparity in competitiveness throughout Europe; while some countries show high economic surpluses, others have continued significantly indebted. This economic inequality has enabled the rampant indebtedness and lack of financing that has obliged some European countries to require bailouts. Jennifer Blanke, a senior economist at the World Economic Forum, sums up that "Being a member of the euro zone isn't related to competitiveness. At the end of the day, they need all of the economies making stuff that other countries want to buy (Shuman & Mateo-Yanguas, 2010)." This demonstrates the need for financial reform in the euro zone to foment pan-European integration and create a more unified European market that stimulates economic growth in all member states.

2. RENEWABLE ENERGY INDUSTRY IN SPAIN

With non-renewable resources being consumed rampantly throughout the world, renewable energy is arguably the future fuel of the global economy. As carbon fuel prices meet and then surpass the cost of everyday more affordable renewable energy, the enterprises and countries with the foresight to conduct the astounding research being done in wind, solar, geothermic, and biomass energies will receive the spoils. The history of this reputable industry in Spain, its component companies and the contribution it makes to the Spanish economy will preface the discussion of the future economic capabilities of this sector.

2.1 EVOLUTION OF SPAIN'S RENEWABLE ENERGY SECTOR

Francisco Franco's dictatorship wreaked havoc on Spain's economic development. After World War II, while the rest of Europe rebuilt and began industrializing, Spain's borders remained closed. This severely impeded economic progress due to repressing and viciously regulated dictatorial policies. In 1975, Franco's government finally lost power after his death and barriers with the rest of the world were lowered (Royo & Manuel, 2003). Spain's lack of technological prowess and low productivity compared to the rest of Europe required large investments in economic growth and efficiency. From an international perspective this coincided with the 1973 Oil Embargo by the Organization of Arab Petroleum Exporting Countries (OAPEC) and later with the 1979 Energy Crisis (EIA, 2009).

The two crises and the need for widespread development in Spain led to an extensive increase in the demand for energy throughout the country. As such, the Spanish government, led by the Socialist Party, created an economic plan which relied heavily on foreign investment and indebtedness to industrialize Spain (Gutiérrez, 2010). This led to difficulties for Spain in supporting its growing economy and equalizing levels of wellbeing with the rest of Europe with an economy based solely on carbon based energy.

Starting in 1976 multinational energy companies such as Gamesa Corporación, Acciona Energy and Iberdrola emerged and began renovating Spain's energy market. Gamesa Corporación began developing new technologies in robotics and energy production and has now achieved multinational success as an exporter and producer of wind energy products (Gamesa, 2010). Acciona became a forerunner of the renewable energy sector predominantly in solar and biomass energy (Acciona, 2010). The Bilbao based Iberdrola has been an energy producer in Spain for over a century It made the change from a heavily carbon-based energy focus to its current role as a leading producer of renewable and nuclear energy (Iberdrola, 2010).

2.2 RENEWABLE ENERGY STRUCTURE AND COMPANIES

The Spanish Gamesa Corporation is considered a world leader in wind energy technology and production. Gamesa operates in five countries and boasts a research and development average of 150,000 engineering hours annually (Gamesa, 2010; Donoso, 2010). Gamesa, along with fellow renewable energy companies Iberdrola and Acciona energy, is one of the companies that will have an effect on the future of renewable energy in Spain and Europe.

These enterprises, among others, have solidified Spain's position as a forerunner in the renewable energy market. Due to the economic crisis, however, there has been increased pressure for these companies to halt production in Spain and focus their efforts on exportation and international investments (Donovan, 2010). This is in part due to decreased government subsidies to support growth, and more diverse opportunities abroad.

The United States, China and Latin America offer profitable opportunities for Spanish energy companies to export their renewable products. Brazil and China are progressively becoming economic powerhouses but face the difficulties of developing industrious countries while upholding international environmental standards throughout (García Mezquita & Sánchez Díez, 2003). These countries require substantial amounts of energy to sustain their economic development, which means profitable prospects for Spanish energy companies, who are taking advantage of the opportunities and investing and exporting accordingly. Iberdrola has traditionally focused around one third of its investments externally to Spain since 2001; however, in the years since the start of the economic crisis the rate has increased to closer to half of all Iberdrola investments (Iberdrola, 2010). The problem caused by these types of investments is that they do not enhance the Spanish GDP more than through imported profits. The job creation and economic growth created are both offsets of the initial investments that take place in the venture country (García Mezquita & Sánchez Díez, 2003). As the Spanish Economy is currently facing a crisis, it is imperative that these companies focus on internal development to ensure that Spain does not miss profitable internal investments and is able to meet European standards (Gutiérrez, 2010).

3. EUROPEAN UNION ECF-ROADMAP 2050

The European Climate Foundation (ECF) was founded by the European Union to research and plan the reduction of the economic reliance on carbon energy by at least 80% by the year 2050, an aim set in 2009 at the G8 conference in L'Aquila, Italy (European Climate Foundation, 2010). In Figure 1 the breakdown of the current and predicted energy requisites in Europe is shown; to attain the 80%[1] renewable energy goal, 90-95% decreases in carbon-based energy used in household, transportation, and buildings must be made.

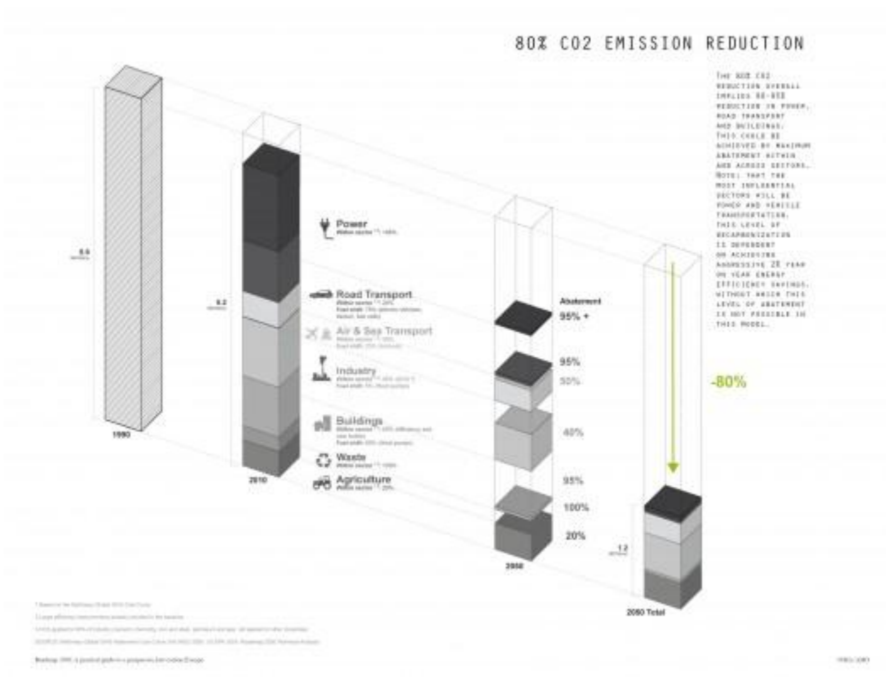

***Figure 1*- Breakdown of current CO2 emissions in Europe and 2050 required breakdown.**
(Source: European Climate Foundation, 2010).

This assessment makes the assumption that energy consumption in industry and agriculture will remain at the same relative level, as the result of a balance of energy efficiency developments and future demand.

[1] Note that research has been conducted for results between a 40-80% decrease in carbon energy reliance. This report will utilize the 80% data for the scenario that meets European Union goals.

A mixture of a pan-European switch to less carbon intensive technologies and the development of a European energy grid based on the flow of renewable power from country to country derived from supply and demand will be needed for the success of the Roadmap (European Climate Foundation, 2010). This will ensure that there is a consistent energy flow throughout Europe to maximize efficiency and demand needs; on a windless Saturday, a household in the United Kingdom could be supplied with solar energy from sunny southern Spain. To examine the economic capabilities of the Roadmap for Spain, it is necessary to investigate current and required pan-European political policies, and the economic challenges and opportunities of the Roadmap.

3.1 POLITICAL POLICIES

"Energy market mixes... are always the result of public and political choices"

- Van Jones, *The Economist* May 9th, 2009

In order to adhere to the ECF Roadmap's timetable, the European Union must ensure that necessary investments can be made pre-emptively by negotiating policies over the next two to three years. The long-term planning involved in the implementation of a forty-year energy strategy requires present commitment from political affiliations throughout Europe (Sweatman, 2010). This means that European politics must assume a fully cooperative approach to energy policy development that considers the future wellbeing of Europe as a whole as opposed to continuing a country specific self-governed system. This is a present challenge for the European Union as the young confederation must contend with the difficulties of political collaboration without causing cultural stagnation or amorphism.

Figure 2 shows the current and projected energy grid transmissions throughout Europe to ensure a sustainable energy flow. In Spain's case, this will require intensive collaboration with France to plan and construct the forty-six new grid lines between northern Spain and France (and through France with the rest of Europe). While construction will be required throughout the majority of pan-Europe transmission connections, the Iberia-France connection is clearly the most pressing site for collaborative expansion (European Climate Foundation, 2010). This connection will ultimately create a connection for Spain's vast solar energy capabilities to be conveyed to the rest of the European Union, a vital transmission link for the successful supply and demand flow of energy throughout Europe.

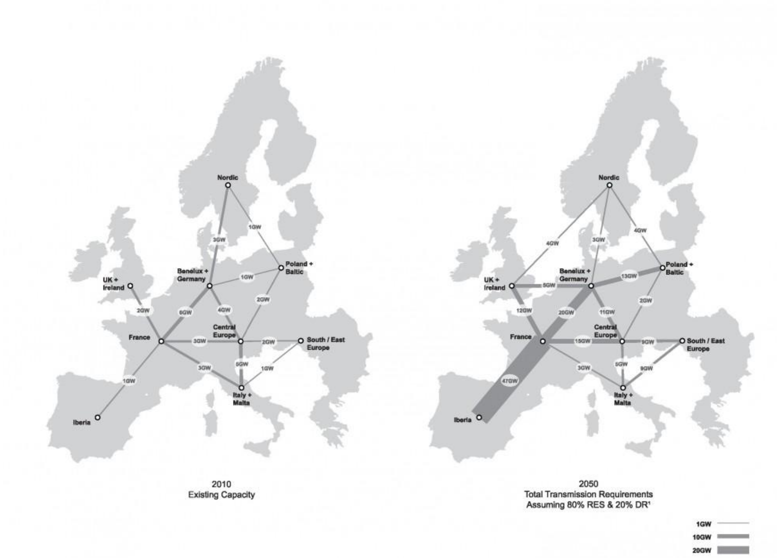

***Figure 2* – Current existing energy transfer capacity in Europe and 2050 requirements.**
(Source: European Climate Foundation, 2010).

Capital investment for the next years is the most exigent of the entire Roadmap. The political regulation of the energy sector could create delays in implementation by driving up capital costs through lack of incentives when trial energy efficiency methods fail (European Climate Foundation, 2010). Renewable energy construction requires high investments and has a long-term rate of return; the start-up costs to erect wind and solar farms are high, and financial returns are gained gradually over years of marginal gains on energy output (Donoso & Sweatman, 2010).

Improvement in energy efficient is inclined toward breakthrough innovations and long-term economic gains which are easily overlooked by short-sighted political reigns. Political nearsightedness entails the sole consideration of the necessary strategies to ensure re-election instead of what is perhaps best for the future of the country. As the European Union becomes more integrated politically, commitment to pan-European initiatives will be straightforwardly managed from an international level. Ideally, economic policies will begin to naturally regulate themselves through fiscal cooperation within the Union.

Unsuccessful implementation of energy efficiency policies could lead to an estimated loss of €300 billion in GDP for Europe by 2050 due to the volatile effect of carbon fuel prices. This figure depends heavily on the increase in carbon fuel prices and relative costs and innovations in energy efficiency. To put this in perspective, consider that €300 billion is nearly a third of the necessary initial investment for the 60% carbon-based energy reduction pathway (European Climate Foundation, 2010). Political concordance for the Roadmap must be managed from the pan-European perspective to ensure that continent wide regulations are met and the economic benefits of the Roadmap are achieved.

The Spanish government is in the process of detailing its *Reformas para la Economía Sostenible*[2] which will entail the position to be taken towards the implementation of European Union and G20 mandated sustainable protocols. The Spanish government has taken the Keynesian stance that political policies and fund injections must be made to stimulate the economy using Plan E to support the economy (Gutiérrez, 2010). While Plan E is a beginning for Spain's involvement in the Roadmap, it fails to fully take advantage of matching long term economic opportunities with current internal strengths. The renewable energy sector will receive mediocre stimulus packages from the government and funding will be provided to private sector enterprises with sustainable focuses (Gobierno de España, 2010; European Climate Foundation, 2010). However, energy policy landmarks fall short of those necessary to reach the Roadmap's goals and maximize Spain's potential in this sector.

3.2 PUBLIC OPINION

Lack of public support is another political risk that must be contended. There is an estimated fluctuation of €250-300 per month in energy cost for every European household by 2050 based on assumed increases in carbon fuel price and renewable energy innovation expectations (Figure 3). Taking into consideration natural inflation costs and that the average European household currently spends €1200-1300 per month on energy, even the possible increase of €300 Euros per month is only a negligible 4.3% price increase over 40 years for the renewable energy benefits of the Roadmap (European Climate Foundation, 2010).

[2] Translates to Reforms for a Sustainable Economy and is abbreviated Plan E.

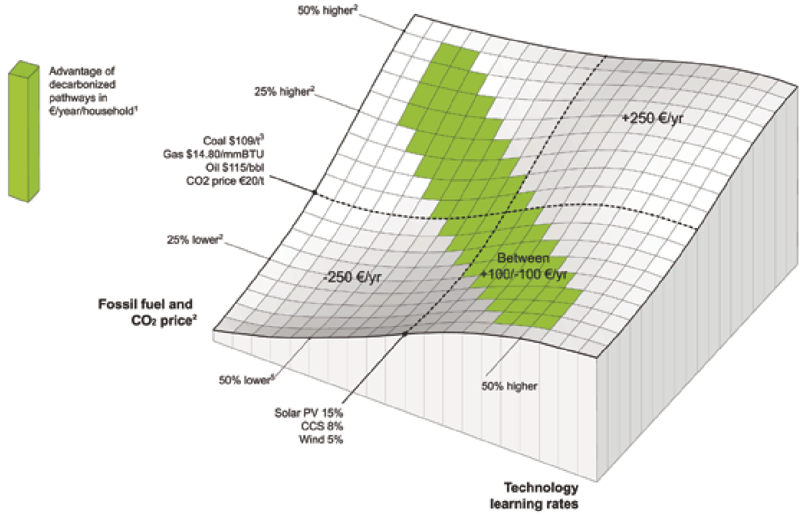

Figure 3 **– Estimated household cost fluctuation based on technology learning rates and predicted fuel prices.** (Source: European Climate Foundation, 2010).

A well-informed populace should be able to appreciate and support the socio-political benefits of this price increase. However there is considerable public resistance to expansive construction of wind farms, solar farms and energy transmission due to the potential scenic and ecosystem damage. In particular, the construction of renewable energy resources in areas that may affect animal migratory patterns in the north of Spain and the impediment of several significant historical landmarks have been polemic (Estefanía, 2009). In order to counter this, information campaigns and educated and informed consent must be obtained to discourage extreme forms of protest (European Climate Foundation, 2010). Large-scale and countrywide changes require positive public opinion; this will ultimately determine the success of the ECF Roadmap. If the European public as a whole are inspired and committed to liberate their economy from carbon reliance, the venture will flourish.

3.3 ECONOMIC CHALLENGES WITH THE ROADMAP

The projected investments provided by research conducted for the Roadmap are considerable to meet the milestones set out. The predicted cost for the enhancement of the grid connection from 1GW to 47GW between Iberia and France will depend on the manner in which the grid is laid out. The challenge of maintaining a mutual flow of energy from Iberia to France through the Pyrenees Mountains through Andorra creates the need for heat pumps to maintain solar energy (European Climate Foundation, 2010). Solutions to this problem could mean the extra investment to lay the energy lines underground or undersea or the possible loss of solar capacity in Spain, requiring a larger expansion of wind energy capabilities (Sweatman, 2010). Though this seems to be a costly venture, when taken in the context of the ECF Roadmap's entire scope, it is one of an array of difficult obstacles to be overcome.

Due to the volatility of renewable energy, backup energy production with 10-15% of the capacity of transmission must be taken into consideration. This means that in order to ensure the ability to maintain a dependable flow of energy throughout Europe, additional energy will be needed in extreme weather circumstances and during unexpected peaks (European Climate Foundation, 2010).

Germany recently decided to maintain nuclear power plants functioning until 2040 to ensure that the energy mix continuous to have a reliable backup power. Spain will expectedly have to follow Germany's lead, keeping only a relatively trivial percentage of its energy supplied by nuclear means to serve as a stable backup for the planned 2050 energy grid (Donoso, 2010).

The ability to sustain technological growth and learning at the necessary level to sustain the energy efficiency and renewable energy needs for the success of the Roadmap could be lower than predicted (European Climate Foundation, 2010). In order to meet the goals set out by the ECF, large subsidies must be made toward the development of clean technologies, energy efficient goods, and renewable energy technology. Educational reform to inspire the study of professions related to energy efficient "green" careers and Spanish companies' continued prioritizing of research and development will encourage the required technological growth (Gutiérrez, 2010).

The effects of the global economic crisis in Spain have created unforeseen challenges for the implementation of the ECF Roadmap. This has created a necessity for external financing in order for the Spanish government to meet costs, triggering partial cuts in subventions to the renewable energy sector (Donoso, 2010). This is the opposite of what the ECF requests that government policy reform entails over the next years, which are crucial for the initial development of the pan-European grid. Renewable energy companies in Spain are now procuring financing outside of the country to continue progressing (Iberdrola, 2010). Delays in the commencement of the construction of necessary infrastructure to keep up with the timeline set out by the Roadmap will possibly augment the burden placed on the Spanish economy and construction industries when investments are finally made (Sweatman, 2010).

Investments in renewable energy sources remain an uncertain venture in the private sector. This must be remedied to avoid sharp increases in capital cost investment delays in funding will cause. It has been calculated that currently investments throughout Europe of €30 billion per year are required to begin developing renewable infrastructure to sustain the Roadmap´s goals; however, the investment necessary per year increases dramatically in the event of delays to €90 billion per year in 2035 (European Climate Foundation, 2010). This quantity of investment will not only be much more difficult to obtain at that point, but does not comprise the necessary scale augmentations of supply chains to attain the 80% less carbon energy reliance goal.

3.4 ECONOMIC OPPORTUNITIES WITH THE ROADMAP

Within the challenges presented by the ECF Roadmap are opportunities for economic, social and environmental benefits beyond solely supporting energy demands for the European Union. Spain's current position in the renewable energy market is favourable for it to play a lucrative role as a major supplier (ABC, 2010). The abundant population of educated graduates that are unemployed will offer a steady input factor for the successful Spanish renewable energy companies. To meet the Roadmap's demands these companies will require new talent as they make the necessary growths to accommodate emergent market demands (European Climate Foundation, 2010). This coincides with the calculated demand for the construction of an estimated 5000 square kilometres of solar panels and 100,000 wind turbines by the year 2050. With existing technology and production rates, an objective of this magnitude is entirely possible for the European Union; and Spain is in an opportunistic position to economically and socially benefit (Brown, 2010).

The rate of innovation of new technologies by the ECF has the potential to be an underestimate. Novel methods of producing clean and renewable energies are being piloted continually; therefore possible breakout technologies may emerge unpredictably (European Climate Foundation, 2010). Spanish companies are leading the way in this sector as research and development is often found to be their second or third largest internal investment of capital. Innovations in renewable energy often lead to further sustainable advances in other energy-intensive industries. There is promise, therefore, to develop chain reactions and spill-over effects of energy efficient products and strategies throughout the implementation of the ECF Roadmap (Sweatman, 2010). Historically, the effect of innovation can additionally affect future GDP growth rates by as much as 1% based on the development of breakthrough technologies (European Climate Foundation, 2010). An example of a multiple use innovation in solar architecture is technology for storing solar energy using materials that are also utilized as heating sources in homes and buildings.

With an annual average of 2600 hours of sunshine per year, it is no surprise that Spain has one of the strongest solar energy industries in Europe. Aside from some potential in southern Europe, Iberia will be the prime resource for Europe in the Roadmap. Vast amounts of solar energy capabilities are available in Africa and the Middle East; however, potential expansion of gridlines into these areas has not been calculated at this point (European Climate Foundation, 2010).

Spain is therefore in an excellent position to utilize its climate advantage to construct the necessary solar energy capacities to supply northern Europe with the majority of the required 300 terawatt capability.

The ECF Roadmap has stated that there is a high priority to reach price convergence for electric and petroleum vehicles in Europe. Price convergence in the automobile industry will improve the case for European carbon neutrality because demand for electric vehicles will approach and later surpass that for the more costly carbon-fuel based ones. To put the impact of this shift into context, if price convergence between conventional and electric cars were to occur today, it would connote an improvement in the decarbonised case of €500 billion over the next forty years (European Climate Foundation, 2010). Support for the automotive industry will ensure that beneficial GDP effects of the implementation of infrastructure to support electric and hydrogen fuel cell transportation remain in Spain (Burdick, 2009). However, in order for this shift to be beneficial, in the long run the electrical energy being consumed by vehicles must not be drawn from carbon-based sources.

4. THE SPANISH CONTEXT TO THE ECF ROADMAP

Through examination of the current economic ambient in Spain and quantifying Spain's upcoming challenges to attain the landmarks of the ECF's renewable energy Roadmap, the correspondence between the opportunities presented and the current challenges being faced by Spain are clear. Through the use of a SWOT (*Strengths, Weaknesses, Opportunities, Threats*) analysis (Table 1), it is apparent that employment formation, innovative markets, Europeanism, and financial prospects are the most beneficial correlations.

Table 1 **– SWOT Analysis for Spanish Involvement in the ECF Roadmap 2050***

SPAIN			
Strengths	Weaknesses	Opportunities	Threats
-Highly educated workforce - Renowned renewable energy sector - Climate, more annual hours of sunshine than any other EU Country - New generation with pan-European identity	- Current economic reputation in the EU, high debt cost - Unemployment rate higher than in 16 years - Lack of financial support from EU members in more financially stable positions	**ECF Roadmap:** - Large scale construction - pan-European cooperation -Employment creation -New market creation, especially electric vehicles and energy efficiency	-Lack of economic concordance within the European Union -Difficulties in financing - Poor political planning from government -Lack of public support for Roadmap

SPAIN	Opportunities	Threats
Strengths	- Workforce needed to achieve Roadmap goals for energy efficiently and technological development - Necessary to produce 5000km2 of solar energy farms by 2050, majority in Spain. Competitive advantage for Spain and opportunity for companies to invest internally - New generation of Europeans will be more inclined to collaborate productively within the Union	- Inclination toward Europeanism will counter any current nationalistic selfishness over the years. - Spanish renewable energy sector will be able to fund itself, and can accept cheaper debt from abroad if needed.
Weaknesses	- 300.000 – 500.000 jobs produced throughout the roadmap - Spain may improve its financial reputation through leadership in the Roadmap - Development of electrical vehicle infrastructure will stimulate internal demand, creating a stronger electrical vehicle industry	- Public support may be easier to gain during a crisis if informed of direct benefits - Lack of financial support from the EU will make countries take more radical steps to recuperate their economy, this can be beneficial in the case of extreme projects like the Roadmap

** Uses a match and convert method*

4.1 EMPLOYMENT CREATION

The high unemployment rate of post-secondary educated graduates and construction industry workers will be able to fill the hundreds of thousands of employment positions developed by the renewable energy sector's growth throughout the Roadmap. This figure includes both job replacements for layoffs from the carbon energy industries as well as innovative "green" careers (European Climate Foundation, 2010). Generating this employment will start to halt the exodus of young Spanish talent, keeping their salaries in Spain to stimulate economic growth (Bush, 2010). The scope of the venture to build forty-six new gridlines connecting Spain with France will provide construction employment to replace work lost after the housing bubble burst. Spain has followed Germany with building code reforms that require all reconstituted and new properties to include solar panels on the roofs, producing additional labour and architectural employment necessities (Bush, 2010). By continuing to invest heavily in research and development and education, Spain will create national experts in the renewable energy field, which will create competitive advantages throughout the execution of the ECF milestones.

4.2 ELECTRIC VEHICLE MARKET

The vehicle sector, which makes up 25% of Spain's exports, is a prospective industry for Spain to concentrate on and become a leading producer of electric vehicles in Europe. This would contribute to the ECF's goal of reducing carbon usage and provide Spain a niche market that is currently growing in Europe. There are few Spanish vehicle companies; however, historically lower labour costs relative to the rest of Europe have acted as incentive for foreign companies to produce in Spain (Estefanía, 2009).
The Spanish ministry of industry created Proyecto Movele in which infrastructure to support the sale of electric vehicles is supported and subsidized. By providing infrastructure that supports electric vehicles,

the Spanish government will create incentives for vehicle companies to innovate energy efficient vehicles to be produced and sold in Spain (Burdick, 2009).

In the middle of an economic crisis, focusing on new markets like this can save companies and create employment (European Climate Foundation, 2010). Proyecto Movele is a great example of the way political policies and subsidies are able to stimulate economic growth and sustainable energy practices that will reach the ECF Roadmap's goals simultaneously.

4.3 PAN-EUROPEAN IDENTITY AND COOPERATION

The current generation of European citizens is growing up with a different set of values than those of their ancestors. European youth tend increasingly towards identifying themselves not as a collective of different countries, but as a unified political system of unique cultures working together. Creating a pan-European identity was an ideal produced by Winston Churchill shortly after World War II, who suggested the visionary concept of a United States of Europe that would unify and politically regulate the member states (McCormick, 2010). This started the European Union down the path towards its inauguration in 1993 after years of sluggish enlargement and membership planning. It has since steadily grown to its current twenty-seven member countries.

A unified Europe is, therefore, a relatively novel principle. Ideals that primarily supported the unification of countries, such as prevention of war and the maintenance of democratic processes, are now being overshadowed by more polemic economic and social unification (McCormick, 2010). In order to successfully achieve extensive initiatives like the ECF-Roadmap, it is advantageous for the new generation of European politicians to support Europeanism in order to stimulate the necessary social and economic change that must take place. European youth are growing up in a united Europe in which they have opportunities to create a unified identity beyond their own national one.

The Erasmus program is an example which encourages the sharing of multicultural and scholarly resources throughout Europe and has been attributed to contributing to creating a pan-European identity. Erasmus was not implemented until 1987; however, the lasting advantages of the program will not be felt until the current generation enters the world of business and politics (McCormick, 2010).

Political and social unification of the member countries in the European Union will be vital to the ultimate success of the initiatives of the ECF Roadmap and ridding Spain of the effects of the financial crisis. A Eurocentric mindset will endorse the betterment of the European Union as a whole, as opposed to disparagement between countries in stronger and weaker economic situations (Gutiérrez, 2010). The ECF Roadmap suggests a novel approach to energy markets that requires pan-European cooperation and the emergence of the concept that the European Union's success as a whole is more important than that of any single member country.

4.4 FINANCING THE ROADMAP

In order to finance the necessary developments of the Spanish renewable energy sector to meet the Roadmap's goals, the Spanish government will have to subsidize so far as possible to make long-term return. Otherwise, foreign investment will be essential to ensure that ECF milestones are met. It is ideal for Spain's government to attempt to invest as much as possible in its successful renewable energy enterprises to maximize public revenues; however, the benefits of foreign investments will nevertheless continue to stimulate economic growth as the employment and infrastructure created will be in Spain regardless of where investments are from (Gutiérrez, 2010).

Political reform will need to be performed in the European Union to integrate the energy market into a single market. This will require overcoming resistance from dominant energy enterprises by making then compete throughout the continent, essentially ruining monopolistic advantages. Successful implementation of the Roadmap over the next years will in great part rely on countries within the European Union that have financial surpluses reinvesting their capital in weaker EU economies to stimulate domestic demand (Schuman & Mateo-Yanguas, 2010).

CONCLUSION

The lasting socio-political effects of successful implementation of the ECF Roadmap would mean the dawn of a new era of cooperative European politics. The international implications of this could mean the eventual envelopment of northern Africa and the Middle East into the European grid. The notion of successful international cooperation of this magnitude could funnel into other global communities: NAFTA, UNASUR, and ACD power grids could follow not only encouraging global unity but stimulating worldwide sustainability. This would essentially remove carbon energy dependence from the global economy.

Demand for renewable energy will only increase as renewable investments and energy efficiency improve, while non-renewable carbon resources are exhausted. Although Spain is yet enduring the symptoms of the global financial crisis and requires further political progress than has been obtained, there are strong incentives to alleviate current weaknesses by taking advantage of emergent opportunities in the renewable energy market set forth by the Roadmap.

Spain is in an excellent position to utilize its climate advantage to attract foreign funding to augment its solar energy capacities to supply northern Europe with the majority of the predicted 300 terawatt capability. With the right mix of political policies, public support, subsidies, and foreign direct investment Spain can recover itself from the challenging position created by the financial crisis and act as a leader for Europe, and possibly the world into a new age of renewable energy.

REFERENCES

ABC (2010) ´En 2050 Europa Podría Cubrir Gran Parte de Demanda Energética con Renovables´ *ABC Noticias*, http://www.abc.es/agencias/noticia.asp?noticia=344310 Accessed November, 2010

Acciona Energía (2010) Acciona Energía Official Website http://www.acciona-energia.es/ Accessed November, 2010

Brown, G. (2010) ´Climate Change Action Is Economic Common Sense´ *The Huffington Post*, 10 October 2010

Bunuel, M. (2010) ´The Role of Renewable Energy for Climate Change Mitigation´ *GersonLehrman Group,* http://www.glgroup.com/News/The-Role-of-Renewable-Energies-for-Climate-Change-Mitigation-51461.html. Accessed October, 2010.

Burdick, D. (2009) ´Project Movele: Spain´s Electric Car Plan´ *The Huffington Post*, 19 March 2009.

Bush, R. (2010) 'Gigawatt-Scale Transmission Global Viewpoint' *Prism Business Media*, pp. 9-10

Cerrillo, A. (2010) ´El Precio del Carbon Limpio´ *La Vanguardia*, http://www.lavanguardia.es/ciudadanos/noticias/20100909/54000510775/el-precio-del-carbon-limpio.html Accessed September, 2010.

De Cervantes, M. (1605) 'El Ingenioso Don Quixote de la Mancha' *Francisco de Robles*, Madrid

Donoso, J. (Director, Gamesa Corporation) "The Future of Energy Policy and Regulation" Presented at the *Leading to the Next Big Thing* IE Social Responsibility Forum (13 November 2010).

Donovan, C. (Trustee, Active Earth Foundation) "The Future of Energy Policy and Regulation" Presented at the *Leading to the Next Big Thing* IE Social Responsibility Forum (13 November 2010).

Estefanía, J. (2009) ´Dónde Poner el Foco de la Atención´ *El País*. February 16, 2009 http://www.elpais.com/articulo/economia/poner/foco/atencion/elpepieco/20090216elpepieco_6/Tes?print=1 Accessed October, 2010.

European Climate Foundation (2010) *Roadmap 2050 – A Practical Guide to a Prosperous Low-Carbon Europe*, European Climate Foundation, London

Fidler, S. 'The Euro's Next Battleground: Spain' *Wall Street Journal – Eastern Edition* 2/25/2010, Vol. 255 Issue 45, pA1-A8.

Gamesa Corporation (2010) *Gamesa Official Website* http://www.gamesacorp.com/en/ Accessed November, 2010.

García Mezquita, Y. & Sánchez Díez, Á. (2003) ´La Internalización del Sector Energético Español´ *Revista de Economía Mundial - Sección Especial: Energía*, 9, pp. 53-79.

Government of Spain. (2010) *Economía Sostenible*. http://www.economiasostenible.gob.es/ Accessed 29 November, 2010.

Guzman, G. and Garcia, CMR. 'La European Union Crises: 2008-2009' *Revista Latinoamericana de Economía*, Vol. 41 Issue 161, p13-39.

Gutiérrez, E. (Professor of Spanish Economy, Universidad Carlos III de Madrid) Personal Interview, 15 November, 2010.

Gutiérrez, M. (2010) ´Renovables para Superar la Crisis´ *Red Latinoamericana de Diarios de Tierramérica*, http://ipsnoticias.net/nota.asp?idnews=96472 Accessed September, 2010.

Iberdrola (2010) *Iberdrola Oficial Website* http://www.iberdrola.es/webibd/corporativa/iberdrola?IDPAG=ESWEBINICIO Accessed November, 2010.

International Monetary Fund (2009) *GDP per Country 2009* http://www.imf.org/external/pubs/ft/weo/2010/02/weodata Accessed 14 November, 2010.

Jones, Van (2010) 'The Proposer's Opening Remarks' *The Economist* http://www.economist.com/debate/days/view/481 Accessed 20 November 2010.

Kirby, J. and Hawaleshka, D. 'Europe Gets Greeced' *Maclean's* 5/17/2010, Vol. 123, Issue 18, p34-36.

McCormick, John (2010) *Europeanism* Oxford University Press, 2010.

Royo, S. and Christopher Manuel, P. (2003) *Spain and Portugal in the European Union – The First Fifteen Years*, Frank Cass, London

Schuman, M. and Mateo-Yanguas, C. 'How To Fix Europe.' *Time* 7/12/2010, Vol. 176 Issue 2, p38-41.

Sweatman, P. (Founder, Climate Strategy and Partners) "The Future of Energy Policy and Regulation" Presented at the *Leading to the Next Big Thing* IE Social Responsibility Forum (13 November 2010).

U.S. Energy Information Administration (EIA). (2010) 'Annual Energy Review 2009' *US Energy Information Administration*, Washington.

World Business Council for Sustainable Development. (2010) ´Visión 2050: Una Nueva Agenda para los Negocios´ *Copyright WBCSD*, Switzerland.